THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION AND VOCATIONAL TRAINING

FORM TWO SECONDARY EDUCATION EXAMINATION, 2012

0034 AGRICULTURAL SCIENCE

Time: 2 Hours **ANSWERS** .

Instructions

1. This paper consists of Ten questions in section A, B, C and D with total of eight question.
2. Answer all questions in section A, B and C and one question in section D.
3. All writings must be in **blue** or **black** ink.
4. Communication devices and any unauthorized materials are **not** allowed in the assessment room.
5. Write your **Examination Number** at the top right hand corner of every page.

1. Write TRUE for a correct statement or FALSE for a statement that is not correct.

(i) An immediate care to a person who has been injured during farm operation when medical care is delayed is known as First Aid.
Answer: TRUE

(ii) Weeds are totally harmful to plant crops and farm animals.
Answer: FALSE

(iii) In poultry husbandry toe pecking and cannibalism are desirable poultry habits.
Answer: FALSE

(iv) Mixed cropping is the action of growing crops and keeping farm animals at the same time.
Answer: TRUE

(v) Land as a factor of production includes all natural resources that are found in a certain place.
Answer: TRUE

(vi) The largest proportion of the soil volume is mineral matter.
Answer: FALSE

(vii) Most fruits are canned because they are perishable.
Answer: TRUE

(viii) Ruminant farm animals like cows, goats, and sheep have four stomach chambers.
Answer: TRUE

(ix) Early crop planting is one of the mechanical methods of weed control.
Answer: TRUE

(x) In farming business economics, prices of commodities are determined by the forces of supply and demand.
Answer: TRUE

2. Match the items in set A with those in set B by writing the correct letter below the corresponding question number in the table provided.

Set A
(i) A chemical used to kill weeds in crop fields
(ii) A cow purposely kept for meat production
(iii) Graphical representation of the quantity of goods bought at different prices
(iv) Identification of fertile poultry eggs

(v) Leguminous crops
(vi) Major factor affecting livestock distribution in Tanzania
(vii) Power generated from water
(viii) Production of crops for food or sale
(ix) Useful for retaining soil moisture, regulating soil temperature and suppressing weeds
(x) Vertical arrangement of soil horizons

Set B
A. Arable farming
B. Beans and pigeon peas
C. Beef cattle
D. Candling
E. Climate
F. Dairy cattle
G. Demand curve
H. Herbicides
I. Hydro power
J. Insecticides
K. Maize and wheat
L. Mulching
M. Soil porosity
N. Soil profile
O. Solar power
P. Supply curve

Answers

i	ii	iii	iv	v	vi	vii	viii	ix	x
H	C	G	D	B	E	I	A	L	N

3.
(i) When choosing a site and establishing a vegetable garden, you consider:
A. Soil fertility, climate, and pests
B. The availability of land and workforce
C. Proximity to water, soil fertility, and availability of inputs
D. Market demand, soil fertility, and availability of fertilizers
Answer: C
Reason: Proximity to water, soil fertility, and availability of inputs are critical for the growth and maintenance of vegetables. Option A lacks emphasis on water proximity, which is essential. Option B does not consider soil fertility or water availability. Option D emphasizes market demand, which is secondary to the practical factors mentioned in C.

(ii) A cropping system which enables a farmer to apply various cultural practices to control weed problems is:
A. Mixed cropping
B. Intercropping
C. Crop rotation
D. Row cropping
Answer: C
Reason: Crop rotation allows for alternating crops that suppress weeds and improve soil health. Mixed cropping and intercropping primarily focus on crop diversity but do not specifically target weed control. Row cropping is focused on planting alignment, not cultural practices for weed control.

(iii) The most important soil component to a farmer is:
A. Air
B. Animal parasites
C. Organic matter
D. Water
Answer: C
Reason: Organic matter improves soil fertility, water retention, and structure. Air is necessary for root respiration but is secondary. Water is vital, but its availability often depends on organic matter. Animal parasites are irrelevant to soil fertility.

(iv) Perfectly inelastic demand occurs when goods under consideration:
A. Are a lot of close substitutes
B. Have no close substitutes
C. Are perishable goods
D. Are in competition
Answer: B
Reason: Perfectly inelastic demand means consumers will buy the product regardless of price, which is only possible when there are no substitutes. Substitutes (A) or competition (D) make demand elastic. Perishability (C) does not necessarily affect elasticity.

(v) When the Tanzanian government sells some of its crops stored in silos, it aims at:
A. Decreasing crop prices
B. Increasing prices
C. Increasing production
D. Stabilizing prices
Answer: D
Reason: Selling stored crops prevents shortages or surpluses, stabilizing market prices. Decreasing (A) or increasing prices (B) are not the primary goals. Increasing production (C) is unrelated to releasing stored crops.

(vi) Which of the following tractor engine parts make a rotary motion?
A. Crank shaft

B. Cylinders
C. Oil sump
D. Piston
Answer: A
Reason: The crankshaft converts the piston's linear motion into rotary motion. Cylinders (B) house the piston movement, oil sump (C) stores lubrication oil, and the piston (D) provides linear, not rotary motion.

(vii) According to a system used by the International Society of Soil Science, soil particles are classified according to their:
A. Diameters
B. Porosities
C. Structures
D. Textures
Answer: A
Reason: Soil particle classification is based on diameter sizes such as sand, silt, and clay. Porosities (B), structures (C), and textures (D) are derived characteristics, not the primary basis.

(viii) The recommended grazing system in areas with high population densities is:
A. Continuous grazing
B. Rotational grazing
C. Tethering
D. Zero grazing
Answer: D
Reason: Zero grazing conserves land and ensures intensive use of small areas, which is essential in densely populated regions. Continuous grazing (A) depletes land, rotational grazing (B) requires more space, and tethering (C) limits livestock movement.

(ix) The weakness of human beings as sources of farm power is:
A. They may fall sick during farming seasons
B. They are naturally lazy and subject to social problems
C. They get tired and their ability to supply power is limited
D. They need food and their ability to supply power is unlimited
Answer: C
Reason: Human labor is limited by physical fatigue, unlike machinery. Falling sick (A) or needing food (D) does not directly affect power availability as much as fatigue. Laziness (B) is a subjective and incorrect generalization.

4. Name an instrument or tool which you can use in performing the following farm operations:

(a) Turning the soil, making ridges, weeding, and uprooting stumps: Hand hoe
This tool is commonly used in small-scale farming for loosening and turning the soil, forming ridges, and removing weeds and stumps.

(b) Leveling the soil, removing stones and weeds: Rake
The rake is suitable for leveling and clearing debris like stones and weeds, ensuring a smooth seedbed.

(c) Turning and spreading manure: Fork
A fork is effective in handling bulky organic matter such as manure for spreading evenly over the field.

(d) Digging shallow holes and transplanting seedlings: Trowel
The trowel is ideal for precision digging and transplanting delicate seedlings into the soil.

(e) Trimming hedges: Shears
Shears are designed for cutting and shaping hedges to maintain their desired height and structure.

(f) Harvesting cereals and cutting grass: Sickle
The sickle is commonly used for harvesting cereals like wheat and rice and for cutting grass.

(g) Watering seedlings: Watering can
A watering can delivers controlled amounts of water to seedlings, preventing damage.

(h) Sawing wood along the grain: Hand saw
The hand saw is ideal for cutting wood along its natural grain for smooth finishes.

(i) Cutting and shaping cold metals: Chisel
The chisel is used for detailed cutting and shaping of cold metals during fabrication.

(j) Connecting pipes in a straight line: Coupling
Couplings are fittings used to connect two straight sections of pipe securely.

5. (a) Define the following terms:

(i) Soil: The topmost layer of the earth's crust that supports plant growth and contains minerals, organic matter, water, and air.

(ii) Soil profile: The vertical section of the soil from the surface to the unaltered bedrock, showing distinct layers or horizons.

(b) What is the function of organic matter in the soil?
- Improves soil fertility by supplying essential nutrients to plants.
- Enhances water-holding capacity, ensuring consistent moisture for crops.
- Promotes soil structure by binding particles into aggregates.
- Supports microbial activity, which is vital for nutrient cycling.

6. (a) Define the following terms as used in crop production:

(i) Plant population: The total number of plants per unit area in a given crop field.

(ii) Staking: The process of providing physical support to plants such as tomatoes or beans to keep them upright.

(iii) Spacing: The distance maintained between plants in rows and columns to ensure optimal growth and yield.

(b) A young entrepreneur established a 0.25 ha of a cabbage project around his/her homestead. The spacing used was 60 cm x 60 cm. If all plants survived, calculate the plant population in the garden:
Step 1: Area in square meters = 0.25 ha x 10,000 = 2,500 m^2
Step 2: Area per plant = 0.6 m x 0.6 m = 0.36 m^2
Step 3: Plant population = Total area / Area per plant = 2,500 / 0.36 = 6,944 plants

7. (a) Briefly explain the meaning of the term "Crop pest":
An organism that causes harm or damage to crops, reducing yield and quality. Examples include insects, rodents, fungi, and weeds.

(b) Categorize four direct harmful effects of insect pests on crop plants:
(i) Chewing leaves, reducing photosynthesis.
(ii) Cutting plant stems, leading to stunted growth.
(iii) Piercing fruits, causing rot or disease entry.
(iv) Sucking plant juices, weakening the plant.

(c) Mention five cultural methods used to control insect pests in the field:
(i) Crop rotation to break pest life cycles.
(ii) Intercropping to confuse pests.
(iii) Timely planting to avoid peak pest seasons.
(iv) Use of resistant crop varieties.
(v) Proper field hygiene, such as removing debris that harbors pests.

8. (a) Define the term "supply":
Supply refers to the quantity of a good or service that producers are willing and able to offer for sale at various prices over a specific period.

(b) Mention nine factors that may cause a change in the supply of agricultural products in your area:
i. Weather conditions: Favorable weather increases supply, while adverse conditions like drought reduce it.
ii. Cost of production: High production costs may reduce supply due to limited affordability for producers.
iii. Technology: Adoption of modern technology enhances productivity and increases supply.
iv. Government policies: Subsidies increase supply, while taxes or restrictions can limit it.
v. Market prices: High prices incentivize producers to supply more goods.

vi. Pests and diseases: Pests or crop diseases can destroy harvests, reducing supply.
vii. Availability of inputs: Access to seeds, fertilizers, and other inputs directly impacts supply.
viii. Infrastructure: Good transport and storage facilities improve supply by reducing post-harvest losses.
ix. Access to credit: Farmers with access to credit can increase production, boosting supply.

9. Mention five advantages of using animal power over tractor power in farm operations:
i. Affordability: Animal power is less expensive to acquire and maintain compared to tractors.
ii. Versatility: Animals can be used for various activities such as plowing, transportation, and fertilizing.
iii. Adaptability: Suitable for small-scale farms and terrains where tractors may be unsuitable.
iv. Environmentally friendly: Animal power does not emit pollutants like tractors.
v. Resource utilization: Animal dung can be used as organic fertilizer, reducing reliance on chemical fertilizers.

10. (a) Briefly explain what will happen to plant crops when the following practices are applied:
i. Over-watering of tomato seedlings in the nursery: Leads to poor root development and susceptibility to diseases like damping-off.
ii. Irregular watering in tomato plants: Causes blossom end rot and irregular fruit growth due to inconsistent moisture levels.
iii. Excessive application of farmyard manure in carrot plants: Results in abnormal root growth and excessive foliage development, reducing market value.
iv. Excessive application of nitrogenous fertilizers to maize plants: Promotes vegetative growth at the expense of grain formation, leading to poor yields.

(b) Arrange the soil separates (clay, coarse sand, fine sand, and silt) according to their increasing water holding capacity:
i. Coarse sand
ii. Fine sand
iii. Silt
iv. Clay